Research Proposal for Ph.D. Programme

A GEOGRAPHICAL APPRISAL OF LAND RESOURCE AND ITS SUSTAINABLE MANAGEMENT IN MOHAMMAD BAZAR BLOCK, BIRBHUM DISTRICT, WEST BENGAL

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INTRODUCTION:

Resource may be defined broadly as anything that satisfies human need. Land in this connection is the basic natural, economic and ecological resource on which human civilization evolved. It not only satisfy our basic needs of food, clothing and provides our shelter but also sustain the life support system and natural vegetation, biological habitats for plants, animals and micro-organisms. Adopting an economic viewpoint the land itself consists of a basic resource and a factor of production other being the labour and capital. It considered to be the storehouse of minerals and raw materials for human use. The agricultural system, industrial set up, transport network all are directly dependant on the land resource. Hence it is the land resource that determines the level of development of any nation endowed with best quality land. According to Young (1998), Since time immemorial ,land resources provides the basis for more than 95% of human food supplies, the greater parts of clothing and wood both fuel and construction.

“Land Resources refer to a delineable area of the earth's terrestrial surface, encompassing all attributes of the biosphere immediately above or below this surface, including those of the near-surface climate, the soil and terrain forms, the surface hydrology (including shallow lakes, rivers, marshes and swamps), the near-surface sedimentary layers and associated groundwater and geohydrological reserve, the plant and animal populations, the human settlement pattern and physical results of past and present human activity (terracing, water storage or drainage structures, roads, buildings, etc.)” (FAO/UNEP, 1997). Land resource includes landscape, soil, water, vegetation and microclimate. Vink (1975)classify the land resources in three categories based on degree of suitability. These are - i) Very stable resources (Climate, relief and geological formation) ii) Moderately stable resources (water, soils and some of the artifact elements such as dikes, terraces, canal, roads etc.) and iii) Relatively stable resources

(vegetation and related biological character)(vink,1975, Jana, 2002). Agricultural expansion, Industrial development, mineral extraction, construction, needs of fibre etc. are intimately linked with these resources,

The signification of land is unquestionable but land is considered as finite or limited resources and each land unit has its own potentiality to meet the human demands to a certain limits. Hence, demand for land is increasing at an alarming rate with the rapidly increasing population. . Currently, land resources are clearly under stress; 16 percent of arable land is degraded and the percentage is increasing (FAO, 1997). Now a days land resources been subjected to a variety of pressures and sometimes creates problems which bring international and intra-national conflicts. There is no way to enlarge these resources but potentiality of these resources can be enhanced to some extent with proper and scientific utilization and of management land. Following J.L Buck, (1951) Land utilisation can be explained as the scientific and developed agricultural activity which can make the way of provision for the future production and contribution to the national needs (Quoted by Nanavati, M.B. and Anjaria, J.J.,1951). Land utilization comprises a relationship that exist between the society in the one hand and cultural advancement, resource planning and carrying capacity on the another hand (Mondal, R.B., 1990).

One cannot think any progress without proper utilization of land and good management practices. In this connection land management refers the way of managing the use and development of land resources. Briefly, management is a way to manage-to forecast, to plan, to organise, to command, to co-ordinate and to control any activity so it would be rational to evaluate every parcel of land to assess the suitability of specific land unit for specific purpose and to propose a suitable plan for sustainable land resource management. According to FAO, 1997, Planning of land use is an essential step along the road to sustainable resource use. Planning of land use should not be a top-down procedure, but a decision support mechanism,

intended to guide the land user or decision-maker through the process of choosing the best land-use option, or range of options, consistent with his or her objectives. Often, the process of planning which promotes interaction among land users, decision-makers and professional and technical staff is more important than the documentation of the plan which results from this exercise (FAO, 1997).

Sustainable land management is a knowledge based procedure .The approach of the present study is to identify and evaluate the potential attributes of land and to formulate strategies for optimum utilisation of those resources attributes to satisfy the growing human need with close integration of water and other biotic as well as abiotic elements without endangering the ecology and environment.

Mohammad Bazar block is one of the backward block of Birbhum (P.U.P Report, 2000, F.R Siddika and K,Gupta , 2017). Physiographically the study area constitute the plateau fringe region located between plateau proper on the west and plain on the east where resource endowment is fragile in nature .The study area is based on mainly rural agricultural activities and in some cases on mining activities. Poor illiterate farmer have practically no knowledge about the carrying capacity as well as the potentiality of existing land resource of the study area which causes either underutilization of existing resource base or over utilization of land and consequently attributed to land degradation. In this present study an attempts have been made to assess the existing resource base as well as potentiality of these resource base in the study area and to recommend a management plan which not only enhance the potentiality of particular bio physical unit but also maintain the sustainability for long term basis.

LOCATION OF THE STUDY AREA:

In order to substantiate adoption of the present approach in this study, the Mohammad Bazar Block (23˚ 56’N-24˚ 06’N and 87˚27’E -87˚40’E), is located in the western part of the Birbhum

district, West Bengal has been selected (**Fig. 1**). It has a common boundary with Raniswar CD Block,in Dumka district of Jharkhand in the west, while the northern and southern boundary is common with Rampurhat-I block and Suri-I respectively. Similarly, the eastern part is common with Mayureswar-I and Sainthia blocks. The total coverage of the study area is of 315.64 sq.km .The block lies in Suri Sub-division. This block consists of 158 villages. Among them, 138 villages are inhabited and 20 villages are uninhabited. The block further divided into different lower order administrative units for policy and programme implementation. It consists of one panchayet samiti, twelve Gram Panchayet, 56 gram samsads (village councils) and 158 mouzas. Angar garia is the headquarters of this C.D block. The twelve gram panchayet are Angargoria, Bharkata, Bhutura (Seharakuri), Charicha, Deucha, Gonpur, Hinglow, Kapista, Mohammad Bazar, Puranagram, Rampur and Sekedda.

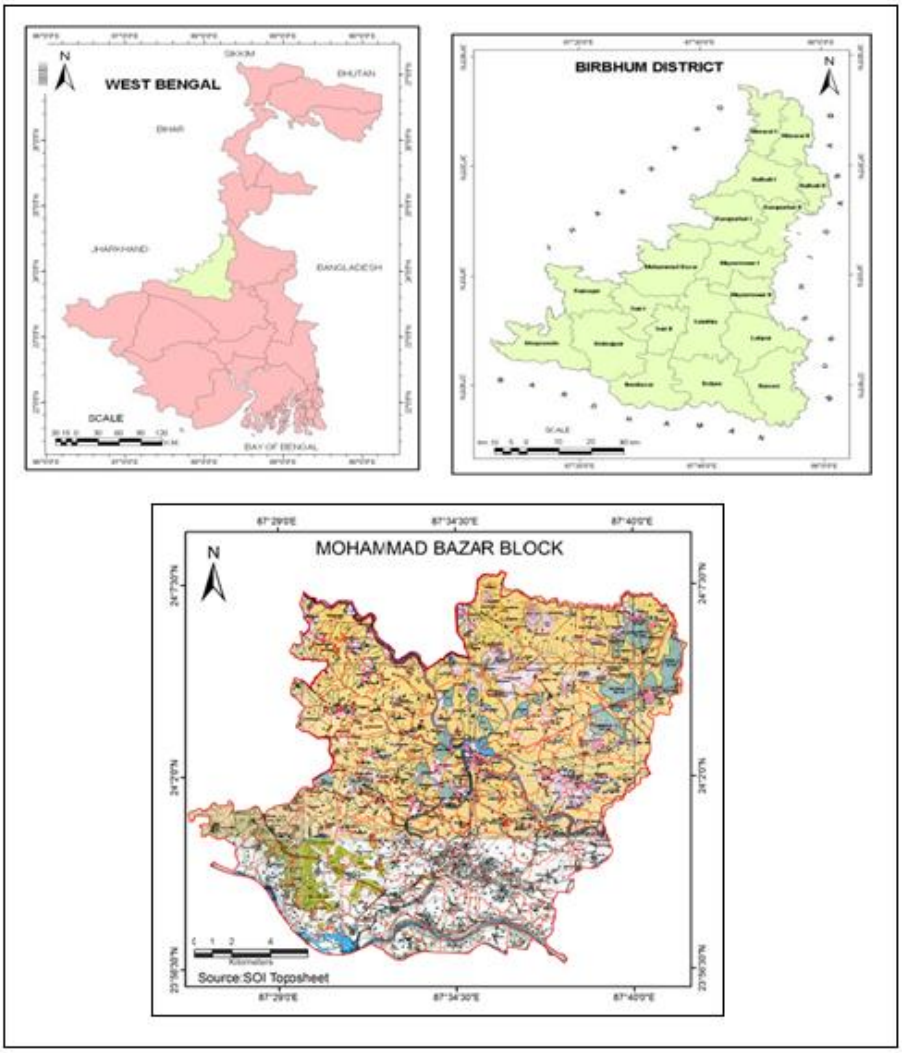

Fig No :1.- Location Map of the study area.

JUSTIFICATION FOR SELECTION OF THE STUDY AREA:

The physiography of Mohammad Bazar block is characterized by highly dissected undulating plateau fringe in the west and south west to rolling level plain alluvial landscape in the east. The geological formation in the study area have strong control in the physiography of the area under reference.

The area is evident with several geological formation with highly weathered pediment of Achaean to Proterozoic formation in the west and south west to alluvium in the east. Rajmahal

trap Basalt of Jurassic to cretaceous and laterites of Cainozoic period are some important intermittent formation evident in the study area. Over the time the litho units how are under the cover of weathered residuum of varying depth. In general these residuum are in-situ but in some of the areas it is transported from the upper reaches or both. Given the varying depth of weathered regolith of varying lithology the properties of soil and so its potentialities are not identical.

The study area is one of the agriculturally backward block (D.P.U.A Report, 1997, Siddika, F.R and Gupta, K. 2017). Economy of the block is based on mainly agriculture and allied activities. Some people is based on stone mining. But this activities do not considerably support the socio economic condition of the local inhabitants. For betterment of standard livelihood it is essential to adopt a proper land resource as well as land use/land cover management.

Hence, from the given physical characteristics and socio economic condition of the study area it is urgently necessary to find out the potentiality of the existing land resource base for judicious utilization in a way and to propose an action plan which would maintain the sustainability for long term basis

REVIEW OF LITERATURE:

Literature Review is a very important part of any research for better and clear understanding of the perspectives of the research problem. Review of literature in connection with the study helps researchers to modify and improve the present analytical framework and to understand the problem situation in the right direction (G. Koil Samuel, 2013).Review of literature would also help the researchers in objective and hypothesis setting, to compare his/her own findings and to find the research gap which are considered the most important part of research.

Land Resources Management in International context:

Importance of study on land resource has been perceived with the passage of time but few works have been attempted by the researchers to land resource studies before nineteen century. It is evident that much of the studies upto early 1970are oriented Land use/ Land cover or land utilisation. However post 1970 emphasis are more given towards Land evaluation. However, for the last two decade studies are more focused towards evaluating different resource attributes of land and their sustainable management for utilisation of land resources.

In Britain L.D. Stamp was the pioneer of 'land Utilisation Survey' in 1930.the main objective of his studies was to record the use of every parcel of land in Britain.

Study of land evaluation got attention of many researchers and planners after foundation of FAO, 1945.foundation of FAO added a new dimension in land evaluation studies. A large number of expert of many countries developed their own concepts and techniques regarding land evaluation studies.

After world war second many universities research organisation of different countries such as Canada, France, Italy, Poland and Hong Kong, Cyprus gave attention on land utilisation studies.

Later on a second Land use survey of England and Wales was conducted by Miss A. Coleman and K.R.A Maggs (Coleman, 1961, Jana 1997).

Anthony Young (2000) in his book 'Land Resource: Now and for the Future' presents an authoritative review of the resources of climate, soils, water, forest and pastures on which agriculture depends. He illustrates the interaction between land resources and wider aspects of development including population and poverty and gives some forcefully expressed criticisms of current method of land degradation assessment .He makes a summary and perspective at the field of land resources and also recommend measures needed to conserved resources for future generations.

Nishar Ahmed et al (2000) has carried out a study on GIS based fuzzy membership model for crop land suitability analysis and to achieve optimum utilization of available land resources. Overlapping the nine thematic map he prepared final suitability map. FAO approach of land evaluation have been used in this studies and divided the study area from highly suitable to not suitable on basis of climatic, terrain and soil properties data(1976).

Mehrnoush Afshari and Ezzatulla Mafi (2014) was used analytical hierarchy process combined with geographical information system to assess the land capability for spatial development of Shandiz urban region of north east Iran .He demarcated that about 58.5 % of the area under study have moderate to high capability for spatial development due to flat topography ,distant from ground water resources and the intensity of road network whereas about 41.5% area have low to negligible capability for spatial development because of steep slope, main river and proximity to faults .

Land Resources Management in National context:

Land utilization and land use study was conducted in India by a number of researcher and planner. Researchers who contributed in these study were-V.L.S.P. Rao (1956), E.Ahamed (1954),J.S. Yadav (1965),R.N.P Sinha (1965), B.N.Jha (1980) etc.

V.K. Sharma (1991) has studied the use of remote sensing techniques to generate land resource mapping. He used the black and white aerial photographs on a scale of 1:25000, co lateral data and other village based agricultural land use data for preparing the land resource mapping. The main objectives of land resource mapping for sustainable land use planning of some part of southern Haryana and Delhi.

S.C Ramesh Kumar et. al (2002) has carried out the study on economic land evaluation for sustainable land management of watersheds in different Agro climatic zones of Karnataka. This studies deals with the aspects connected with the soil resources data and their economic interpretation to evolve the systems for identifying salient problems. They also made suggestion regarding appropriate ameliorative measures to ensure sustainable land use.

R.B. Singh and Dilip Kumar (2012) assessed the role of remote sensing and GIS for land use land cover mapping and integrated land management in middle Ganga plain. They suggested alternative land use system and the integration of livestock enterprises with the agricultural system for land resources management in the study area.

Saikat Maji and Surya Rathor (2015) have discussed social sustainability of natural resource management activities in dry zone in west Bengal. The main objective of their study was to assess the socio-economic characteristics of the beneficiary farmers of integrated waste land development programme and to assess the level of social sustainability of natural resource management activities.

Sunil Saha (2017) studied the ground water potentiality of Mohammad Bazar block of Birbhum district using the analytical hierarchy process model. He classify the study area into five ground water potential zone namely very poor, poor, fair, good and excellent

OBJECTIVES:

The main objective of the study is to identify the existence resource base as well as the potentiality of these resource base of the study area and to recommend suitable sustainable land resource management plan on the basis of various suitable geomorphic, geological and edaphic component which play an important role in land utilization of the study area.

- To examine the nature of existing land resource base of the study area, with emphasis on its various physical parameters
- To investigate the nature of soil with their physiographic association and to evaluate the potentiality of land along with its suitability for agricultural uses.
- To analyze the existing land use/ land cover pattern of the study area.

- To identify major problems of the study area and to suggest some measure for the management of problem and to prepare an action plan for the best use of existing land resource in a sustainable way.

DATA BASE:

The present studies is based on both primary and secondary data base.

Primary data:

Primary data are collected from field survey. Primary data includes data on measurement on cross section of soil profile in different geomorphic unit, the data on water table, and ground truth observation through different geomorphic unit identification, identification of variousland use /land cover type and geomorphic process operated in this study area. Primary data also collected through questionnaires survey of perception of local people about cropping pattern, crop productivity, stone mining activation etc.

Secondary data:

Secondary data collected from different sources such as various published and unpublished report, various government and non-government office, from Survey of India ,Geological Survey of India, N.A.T.M.O, N.B.S.S , S.W.I.D , Block office ,District Statistical Office, Principal Agriculture Office, Soil conservation office ,A.D.O office, Irrigation department and from some panchayat .

METHODOLOGY:

The whole research work have been divided into three stages –i) Pre-Field, ii) Field and iii) Post Field work

Pre-Field:

The foremost task undertaken during pre-field work was to prepare base map using topographical sheet of S.O.I on a scale of 1:50000 and police station map of Mohammad Bazar block. The base map has been used for geocoding and geo- referencing the satellite image of the study area. Various data have been collected from different publish and unpublished report of several government and non-government office. For the understanding of the nature of land resources especially its physical attributes various thematic map has been prepared on the basis of collected data and map. Due importance have been given on morphometric analysis and interpretation as they focus light on the nature of terrain characteristics in the study area and review of literature is another important work that has been pursued in this part.

Field Work:

The ground truth verification for different pre-field maps of morphometric attributes, identified land use class as well as different geomorphic units from satellite imageries, studying their character, collection of soil sample, visiting the quarry area remains the important tasks in this section of the study. During this period photograph have been taken of specific geomorphic unit as well as geological formation, land use/ land cover type and soil profile of the study area. Some data are also collected from perception survey of local residence.

Post- Field work:

During the post field work generation of thematic maps regarding the land use, morphometry, and other remains the most important work. Preparation of topographical section, construction of soil profile has been done in this section of the study. After preparing the final map, analysis and interpretation has been also done during this phase. Land suitability map, preparation of action plan, identification of proposed land use zones, and eventually, management plan for

the whole study area using each land units has been prepared. Overall, the organization and final write up of the thesis has also been done in this section of the study.

CHAPTERISATION OF THE PROPOSED RESEARCH WORK:

- CHAPTER 1:- INTRODUCTION
- CHAPTER 2:- THE STUDY AREA
- CHAPTER 3:-RELIEF AND DRAINAGE ANALYSIS
- CHAPTER 4:- TERRAIN MORPHOLOGY
- CHAPTER 5:- SOIL AND LAND EVALUATION
- CHAPTER 6:- LANDUSE/LANDCOVER ANALYSIS
- CHAPTER 7: SUSTAINABLE LAND RESOURCE MANAGEMENT
- CHAPTER 8: SUMMARY AND CONCLUSION

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